

Page 1, third full paragraph, (lines 10-13), replace the paragraph as follows:

B2 The Japanese patent Laid-open No. 3-56699 describes pumping an electrolyte to a steel strip submerged in the electrolyte from the hole of an electrolyte in order to prevent the steel strip from waving.

Page 1, fifth full paragraph, (lines 17-23), replace the paragraph as follows:

3. SUMMARY

B3 However, in the art of No. 3-56699, because electrolyte and an electric conductor do not contact each other directly, a large quantity of electrolyte is necessary. The apparatus is large because of a large electrolyte bath. As the electrodes are also located in the electrolyte, a third disadvantage of this prior art technique is that short circuits occur among the electrodes through the electrolyte.

Page 2, third full paragraph, (lines 10-14), replace the paragraph as follows:

B4 To achieve the above purpose, a feature of the present invention is that electrodes have jet openings which jet the electrolyte to the steel strip, that is to say, the electrode is integrated with the nozzle which jets an electrolyte.

Page 2, fifth full paragraph, (lines 19-23), replace the paragraph as follows:

BS According to a feature of the present invention, it is possible to reduce the size of an electrolyte tank storing the electrolyte, because the quantity of an electrolyte decreases by jetting the electrolyte in the air. Therefore, the descaling apparatus is miniaturized.

Pages 2 and 3, the paragraph bridging these pages from page 2, line 24 through page 3, line 2, replace the paragraph as follows:

B6 In contrast to the conventional art wherein the steel to be treated is submerged in the electrolyte, the present invention's use of jetting means for jetting the electrolyte onto the steel strip obviates immersion of the steel strip and the occurrence of short-circuit electric current between the electrodes, thus improving electric power efficiency.

Page 3, the fourth full paragraph, lines 12-14, replace the paragraph as follows:

B7 Another feature of the present invention is that the descaling apparatus further has force adjustment of the jetted electrolyte.

Page 3, the fifth full paragraph, lines 15-17, replace the paragraph as follows:

B8 By adjusting the force of the jetted electrolyte, the waving and the flexure of the steel strip is prevented, and we can arrange the electrodes close to the steel strip.

Page 3, the sixth full paragraph, lines 18-21, replace the paragraph as follows:

B9 Because the electrodes are moved closer to the steel strip, a voltage drop between the electrodes and the steel strip becomes lower, and the electric power for the descaling can be decreased.

Pages 3 and 4, the paragraph bridging these pages from page 3, line 22 through page 4, line 2, replace the paragraph as follows:

B10 By using the above-mentioned descaling apparatus, the steel strip manufacturing apparatus attains an improvement in electric power efficiency and the processing speed, and the manufacturing apparatus becomes small.

Page 5, the first full paragraph, lines 4 - 9, replace the paragraph as follows:

B^u The rolled steel strip 1 passes through the cooling hearth 5 and passes through the neutral salt solution electrolysis part 6 that is the first electrolysis part. In the neutral salt solution electrolysis part 6, with the neutral salt solution 20 (shown in Fig. 2) as a sulfate sodium solution, chrome oxide is eliminated.

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Page 7, the second full paragraph, line 6, replace the paragraph as follows:

Fig. 3A shows the anode 23 of Fig. 1 in detail.

Page 8, the first full paragraph, lines 9-16, replace the paragraph as follows:

B¹² We have brought the anodes 23 and the cathodes 24 as close as 1 cm to the steel strip 1 in practice. The distance is 1/10 or less as compared with the conventional electrolysis submerging steel strip. As a result, the electrolytic efficiency improves 65 - 95 % or more compared with the prior art. Therefore, we reduce the voltage from 20V to 7V or less to obtain the same electric current density of 20A/cm² as the prior art.

Page 9, the second full paragraph, lines 18-22, replace the paragraph as follows:

B13
The positive charged part of the steel strip 1 between the cathodes 24 locally becomes an anode 33 (Fig. 2), and on the anode 33 chrome oxide in the oxide film ionizes according to the chemical reaction (1) and dissolves in the neutral salt solution 20.

Page 12, the third full paragraph, lines 9-16, replace the paragraph as follows:

B14
After these processes, the steel strip 43 passes through the descaling apparatus 47 in Fig. 4B, which has the structural details of Fig. 2, 3A and 3B. The descaling apparatus 47 has a hydrochloride electrolysis part 48 using hydrochloric acid 49 as an electrolyte. In hydrochloride electrolysis part 48, the cathodes 24 are arranged in a first upstream half, and the anodes 23 are arranged in the latter downstream half.

Pages 14 and 15, the paragraph bridging page 14, lines 18-26 through page 15, line 1, replace the paragraph as follows:

B15
Another example of the electrodes 23, 24 is explained with respect to Fig. 5. A conductor 29 is placed at a electrolytic passage way 34, and an electric insulating material 30 covers an end of the electrodes 23, 24. As Fig.

B15
5B show, the electric insulating material 30 surrounds the conductor 29, which surrounds the electrolytic passage way 34.

The electric insulating material 30 prevent a discharge between the electrodes and the steel strip when the electrodes 23, 24 contact the steel strip and we can protect the steel strip against damage by the discharge.

Page 15, the first full paragraph, lines 2-4, replace the paragraph as follows:

B16
Other examples of jet force adjustment by electrolyte pressure adjustments are explained with respect to Fig. 6, which shows an arrangement of them on one side of the steel strip.

Page 15, the second full paragraph, lines 5-9, replace the paragraph as follows:

B17
Each electrode 23 (or 24) connects a pressure adjustment element 35 and every pressure adjustment element is connected to a controller 36 which controls the respective pressures. Each electrode 23 (or 24) is also connected to a power supply 25 and a controller 37 controls the power for each power supply, respectively.